

will probably be as sought after as the Crows Foot Elm, Sassafras and Qandong is at the present day.

## Rural Broadcasts.

(The following is the first of a series of radio talks prepared by the Department of Agriculture, Stock and Fisheries and currently being broadcast fortnightly by Station 9 PA, Port Moresby).

## GENERAL REVIEW OF AGRICULTURE IN THE TERRITORY.

Agriculture is of the greatest significance in the economy of this Territory. The known population is at present about 1,300,000, of whom only about 1 per cent. are non-indigenous. Of this 1 per cent. about 30 per cent. are engaged in Agriculture. Of the natives, some 50,000 are engaged as employees in agriculture on the plantations, mining, commerce or by the Administration. For almost the whole of the remainder, agriculture is the principal economic activity, their labours being devoted to the production of food and small quantities of fibres, stimulants, tobacco, etc., in their village gardens and tree groves. When it is realised that the village populations are the source of labour for all organised commercial production in the Territory, the true significance of agriculture in the economy can be appreciated. From the knowledge we have gained from studying some commodities to date, it is estimated that a total of more than 1,000 tons of food per day is produced by native gardening methods throughout the Territory. Agricultural industries also lead the field in export production, agricultural exports in 1952-53 realising £6,196,350 out of a total export value of £8,199,583.

As would be expected in a country which has such great variation in altitude, the climate is far from uniform. In coastal regions, with the exception of an area 60 miles each side of Port Moresby, the rainfall is between 80 and 250 inches per annum with a consistently high range of temperature. The climate of the Highlands is cool and sub-tropical and there is only a slight variation in the mean temperature throughout the year. Conditions at both high and low levels vary from uniformly moist to a sharply defined dry season. With this in mind, it is easy to appreciate the great diversity in agriculture found in this country and the manifold possibilities for development. The existence of a wide range of soil types, including considerable areas of rich volcanics and alluvials adds to these possibilities.

The general aims for food and export crops in the Territory are:

1. Improvement in native food crops.
2. The expansion of pre-war industries where practicable.
3. The reduction of food imports and improvement in native nutrition.
4. Development of new agricultural and pastoral industries.
5. The conduct of agricultural research and investigations essential for the wellbeing of existing rural industries and the development of new ones.

Although literally hundreds of species of economic plants are cultivated by native farmers for food, fibres, stimulants and similar purposes, only a few, namely, yams, sweet potatoes, taro, bananas and coconuts ever figure as major food crops. The important root crop staples offer considerable scope for improvements by selection and distribution of high-yielding and rapidly maturing varieties and by the introduction of improved types from overseas. The increase in the cultivation of certain food crops such as maize, peanuts, sorghum and fruits is expected to considerably improve the native food position and the Department of Agriculture constantly distributes seed of these and urges their greater use.

The efficiency of native agricultural methods in which the standard practice is to crop an area once or twice and then leave it to recover its fertility for a long period in natural fallow could be considerably increased. This matter is receiving attention by Extension officers of the Department of Agriculture and already some improvements have been achieved in particular areas.

The agricultural industries producing export commodities which were well established prior to World War II were Copper, Rubber, Cocoa and Coffee production. All suffered serious direct or consequential damage during the period of military activity and occupation here. The Copra industry has for many years been the mainstay of our agricultural export income and is still pre-eminent, 76,900 tons valued at £4,548,000 representing 65 per cent. of the total value of agricultural exports leaving the country in 1952-53.

Rehabilitation of planted areas of coconuts has progressed steadily since the war and it is noteworthy that native producers show an increased interest in this crop, the amount attributed to them in 1953-54 being 19,000 tons. New plantings of coconuts have been relatively limited and this is a cause of some concern as many of the best established areas are now of considerable age and showing signs of imminent decline. Desiccated coconut and coir fibre are important products associated with the copra industry. The Department of Agriculture has commenced and will continue with a programme of selection of desirable types of parent trees so that improved planting material might ultimately be distributed to persons wishing to replant or make new plantations but this is a long range project. The collection which had been built up at Keravat Experimental Station was unfortunately destroyed during the Japanese occupation.

Rubber, produced almost solely in Papua, is the second most important export, and since the war annual exports have risen from 1,000 tons to 2,800 tons. The Commonwealth Government has stated its support for the expansion of this industry and experts, the most important of whom is Mr. C. E. T. Mann, Director of the Rubber Research Institute of Malaya, have been consulted and given the opportunity of visiting the Territory. By the efforts of the Department of Agriculture in close consultation with men such as these, greatly improved rubber budwood and clonal seed of the newer high yielding strains is being introduced. A number of plantations are at present extending their planted areas and it is intended that introductions shall be continued so that all who are making new plantings can use good quality high-yielding material.

Of the export commodities at present produced here Cocoa undoubtedly seems at the present time to have one of the brightest futures and has been subject to very rapid expansion in the post-war years. Exports have risen from 15 tons in 1946-47 to 478 tons in 1951-52. The volcanic and rich alluvial soil types in this Territory are particularly suited to this crop. Native growers are showing an intense interest and it is estimated that they alone now have about half a million trees planted. The Department of Agriculture



has a well developed selection and breeding programme going at the Lowlands Experimental Station at Keravat, the aim being to provide high-yielding, good quality planting material, and this work has been stated to be pre-eminent by such well-known experts as Mr. D. H. Urquhart, formerly Director of Agriculture in Nigeria, who visited the Territory under the auspices of Cadburys Ltd.

Past experience has shown that both the Highlands or Arabica and the Lowlands or Robusta types of coffee can be grown well in the Territory and good quality coffee produced. Both European and native producers have shown considerable interest in coffee production in recent years, the former particularly tending towards Highland coffee, of which a number of plantations are now established at Wau and in the Central Highlands. Prior to the Mount Lamington eruption the largest producer in the Territory was the Sangara Native Coffee project. However, production here has almost completely ceased. It can be seen, then, that an increase in exports from 7 tons in 1946-1947 to 38 tons in 1951-52 almost entirely reflects the newer developments in the Highlands area.

When it is realised that the imports of the Territory of foodstuffs for the last financial year included as major items, food of animal origin valued at £1,821,066; 12,190 tons of rice valued at £960,969; 8,374 tons of grain and pulses valued at £383,933, it can be seen that the replacement of these items by locally produced foodstuffs is of the utmost importance in balancing the economy of the Territory and such a replacement is a leading objective of the Administration.

A chain of livestock breeding stations is being established and livestock are imported both for the Administration and for private owners. Special quarantine arrangements have been made to facilitate the import of stock from Australia and numbers of producers have been flying in young stock. About 26,000 cattle were carried on plantations before the war but very few of these remained at the cessation of hostilities. Pig production, both commercial and subsistence, is also being studied and encouraged with a view to reducing food imports. Pasture and fodder development, an almost untouched field in this territory, must not be overlooked as an important factor in production of meat and allied foods.

Rice is undoubtedly the most important of the foods at present being imported which could be produced locally and the Administration, through the Department of Agriculture, is making every effort to stimulate small farm production by natives and to develop suitable methods of mechanised production for European enterprise. A very considerable amount of progress has been made in both these fields of work and several European growers and large numbers of natives are now engaged in rice production. However, total production in the Territory at present would not exceed 1,500 tons annually, so that there is great scope for further expansion.

Other grains and pulses which can be grown in the Territory and would greatly relieve the food crop situation are maize, peanuts, soya beans, pigeon pea and sorghum.

With regard to new industries, and particularly new export industries, the Department of Agriculture has tested a number of crops which it considers suitable for development in this Territory. Of these the most important are Tea, Oil Palm, Kapok, Tobacco, Kenaf, Peanuts, Castor Bean, Manila Hemp and Sisal. Others such as Cotton will be the subject of tests yet to be undertaken.

The Department regards its function in relation to these as being to provide disease-free seed or planting material of the best possible varieties to meet local conditions and to test the economics of production so that



potential growers can be advised whether the industries are likely to be profitable or not in territorial conditions. On the other hand, where private interests feel sufficiently assured that they will invest capital and undertake developmental work with any particular crop, the Department will give them all possible material and technical assistance.

Research and investigation are of prime importance in any programme of agricultural development and to meet this need the Department of Agriculture in the Territory has Experiment Stations at Keravat which is a Lowlands Station, Aiyura in the Eastern Highlands at 5,500 feet, Epo in the Western Papuan Lowlands which is particularly for rice work, and Bubia in the Markham Valley. Supplementary and demonstration work is to be carried out at the District Agricultural Stations which will eventually be established in all major districts. Animal breeding and research are being carried out at Stations in the Central Division of Papua, the Central Highlands region and Morobe and New Britain Districts, and it is hoped to extend this work to the important grassland areas such as the Sepik District.

Laboratory facilities are in the process of being established at Port Moresby, Lae and Keravat near Rabaul.

In conclusion, it can be said that this Territory, because of its great land area and wide range of environment, offers considerable scope for expansion of population and of productive effort for both export and subsistence crops. Many types of foods, both plant and animal, and other agricultural commodities such as rubber, fibres, medicinal substances and tobacco, are capable of production and there is room for expansion for all existing agricultural industries and the development of a number of new ones.

---



## NEW AND INTERESTING IDENTIFICATIONS. Plants.

### CLEMATIS GLYCINEIDES.

Evidence given in a murder case before the Supreme Court of the Territory revealed that the juice of green leaves of a plant later identified as *Clematis glycineides* was used by the native people to bring about abortion.

*Clematis glycineides* is popularly known as "Headache Vine" and is reputed to be poisonous to stock. Preliminary chemical tests have indicated that it probably contains Protoanomonol, a volatile toxic compound which quickly polymerises after steam distillation to the solid crystalline acid anemonin.

### PARSONSIA BURUENSIS.

The following is an extract from the report by the State Analyst, Brisbane, on a specimen of a vine identified as *Parsonsia buruensis*, the juice of which was responsible for the death of two native policemen.

There is no reference in the botanical literature to this particular species being poisonous, but several of the other species of *Parsonsia* are recorded as being toxic to stock. However, the *Parsonsia*s belong to the family *Apocynaceae*, a family which contains many poisonous plants—*Oleander*, *Strophanthus*, etc.

Extracts of the bark and softwood portion of the vine gave negative tests for alkaloids, but when injected into guinea pigs proved very toxic, death resulting within ten minutes. A portion was submitted to the Physiology School, University of Queensland, for studies on the heart action of frogs. The resultant charts showed an action closely parallel to that of digitalis. It thus appears likely that the toxic principal of the vine is a cardiac glycoside.

The stomach of Kangelö, when opened, was empty, the inner surface being plum coloured. Extracts were made from this and from the stomach contents of Yamul, but when injected into guinea pigs were without toxic effects. In all probability, any glycoside originally present in the stomachs would have been decomposed.

## Insects.

### LEPIDOPTERA—*Parasa lepida*—*Limacodidae*.

(Nettle Caterpillar).

This insect generally attacks the lower fronds and damage is not as much as that caused by the Hopper-butterfly.

Two Plantation Directors, Mr. Fairfax-Ross from British New Guinea Company and Mr. A. Willis of Steamships Trading Company, reported serious attacks on 20 acres of coconuts at Hisiu Beach and in other scattered areas. Mr. A. Willis also reported attacks on plantations on the East Coast. As far as is known, this is the first recorded occurrence of this pest here.

Mr. Ross saw it attacking Breadfruits (*Artocarpus spp.*) in quantity, which coincides with the description of the host plant by Corbett (in his Bulletin—"Insects in Malaya").

The Caterpillar is greenish with redish stripes and with branched hairs. This insect is known also to attack Castor oil (*Ricinus communis*) and coffee (*Coffea spp.*).